

Requirements Management Practices as Patterns for Distributed Product Management

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Abstract. System products need to be developed faster in a global development environment. A more efficient user requirements collection and product feature analysis become more important to meet strict time-to-market and quality constraints. The goal of this research is to study and find the best practices to support distributed business requirements management during the early phases of product development. The paper describes the process of mining requirements management organizational patterns. The experiences and improvement ideas of requirements management have been collected from a large company operating in the sector of the process automation industry. The results present issues that were found important when managing requirements in a distributed environment. The results are further generalized in the form of an organizational pattern which makes it easier for other companies to reflect on and to apply the results to their own cases.

Keywords: Requirements management, Product management, Distributed development, Organizational patterns, Practices, Mining of patterns.

1 Introduction

Products are getting more complex with customer-specific features and an increasing amount of people attending to development activities. The development environment is often global without physical boundaries. At the same time, faster time-to-market and better product quality is required as the companies should be more cost-effective in harsh business environments. This creates pressures for product development practices.

Product development is a customer-oriented activity where the accurate selection of product features is essential for successful product development projects. The selection of features is made in the early phases of product development, often referred to as “product management” activity. The role of product management is to work as a coordinator between marketing needs and requests for R&D capabilities in order to develop the products within defined timelines and budget and quality requirements [1]. Product managers are responsible for this activity. They gather product ideas and transform them into product features that concretize the ideas. After

various activities, product managers organize the features into the development projects that are responsible for realizing the features in accordance with the schedules. This process of transforming customer ideas into realizable features and assigning them to practical development projects is essential for effective product development. Therefore, it is important that tools and methods that support the management of product ideas, requirements and features are in active use from the beginning of the development process.

An engineering discipline that is responsible for managing these artifacts is requirements engineering. Requirements engineering is a set of activities that cover discovering, analyzing, documenting and maintaining a set of requirements for a system [2]. There are plenty of methods and tools to support this activity. For example, Parviainen et al. [3] have presented an inventory of existing requirements engineering and management methods. They conclude that method descriptions often lack the information of the methods' suitability to different environments and problem situations, thus making the selection of an applicable method or combination of methods to be used in a particular real-life situation, complicated. There is a need to invest more effort in both industrial application as well as research to increase understanding and deployment of the RE concepts and methods [3]. This has been indicated also in Juristo et al. [4]. They conducted a survey about the state of requirements engineering in European organisations (from a software development viewpoint). They found that, at that time, immaturity still defines current RE practices.

Product management viewpoint has received attention in recent studies e.g. [1], [5] and [6]. Grynberg and Goldin [1] study how efficient requirements management can facilitate the work of product managers in the telecommunication industry. Weerd et al [5] have constructed a reference framework for software product management including a requirements management as one key process area in the framework. Ebert [6] presents a field study from Alcatel where the goal was to study how to reduce project delays. The results showed that efficient requirements engineering is already needed in the early phases of product development.

The best-practice companies manage the innovation process efficiently as seen in the picture below (Fig.1) [7]. The best-practice companies will develop more new products to sell than typical companies by effective idea analysing and feature selection processes.

Nowadays, product development is distributed over multiple sites and customers might also operate globally. Globalization forces companies to find ways to overcome geographical barriers, and modern information technology offers excellent means to achieve this goal. Global development has been in active research, for instance, in [8], [9] and recently published as a special issue in [10]. Requirements management has been studied in this context, for instance, in [11], [12], [13], [14] and [15].

When exploring solutions and practical experiences for product management and its requirements management support, the authors found the knowledge somewhat fragmented that has been indicated also in [5]. Therefore, the goal of the research is to study the challenges and find practices to support distributed business requirements engineering during the early phases of product development (i.e. product management activity) (Fig. 2). Our research question was "How to systematize and improve requirements management methods of product managers in distributed development?"